Food Processing

(SIC 20)

SIGNIFICANT POINTS

- The industry has a high incidence of injury and illness; meatpacking plants have the highest incidence among all industries.
- Production workers account for 3 out of 4 jobs.
- Most jobs require little formal education or training; many can be learned in a few days.
- Little growth is expected in employment because of increasing automation and productivity.

Nature of the Industry

Workers in the food processing industry link farmers and other agricultural producers with consumers. They do this by processing raw fruits, vegetables, grains, meats, and dairy products into finished goods ready for the grocer or wholesaler to sell to households, restaurants, or institutional food services.

Food processing workers perform tasks as varied as the many foods we eat. For example, they slaughter, dress, and cut meat or poultry; process milk, cheese, and other dairy products; can and preserve fruits, vegetables, and frozen specialties; manufacture flour, cereal, pet foods, and other grain mill products; make bread, cookies, and other bakery products; manufacture sugar, candy, and other confectionery products; process shortening, margarine, and other fats and oils; produce alcoholic and nonalcoholic beverages; prepare packaged fish and seafood, coffee, potato and corn chips, and peanut butter. Although this list is long, it is not exhaustive—food processing workers also play a part in delivering numerous other food products to our tables.

Table 1 shows that about 29 percent of all food processing workers are employed in plants that produce meat products, and another 26 percent work in establishments that make bakery goods and preserved fruits and vegetables. Sugar and confectionery products, the smallest sector of the food processing industry, accounts for only about 6 percent of all jobs.

Table 1. Employment in food processing by industry segment, 1998 and projected change, 1998-2008

(Employment in thousands)

Industry segment	1998 Employment	1998-2008 Percent change
Total employment	1,686	2.1
Meat products	494	15.4
Preserved fruits and vegetables	229	-5.6
Bakery products	206	-4.7
Miscellaneous foods products	178	10.6
Beverages	182	-9.7
Grain mill products and fats and oils	158	0.8
Dairy products	140	-11.6
Sugar and confectionery products	97	-4.0

Working Conditions

Many production jobs in food processing involve repetitive, physically demanding work. Production workers often stand for long periods and may be required to lift heavy objects or use cutting, slicing, grinding, and other potentially dangerous tools and machines. Food processing workers are highly susceptible to repetitive strain injuries to hands, wrists, and elbows. This type of injury is especially common in meatpacking and poultry processing plants. In 1997, there were 14.5 cases of work-related injury or illness per 100 full-time food processing workers, more than double the 7.1 rate for the private sector as a whole. Injury rates vary significantly in specific food processing industries, ranging from a low of 6.8 per 100 workers in wet corn mills to 32.1 in meatpacking plants, the highest rate among all industries.

In an effort to reduce occupational hazards, many plants have redesigned equipment, increased job rotation, allowed longer or more frequent breaks, and developed training programs in safe work practices. Some workers wear protective hats, gloves, aprons, and shoes. In many industries, uniforms and protective clothing are changed daily for sanitary reasons.

Because of the considerable mechanization in this industry, most food processing plants are noisy, with limited opportunities for interaction among workers. In some highly automated plants, "hands-on," manual work has been replaced by monitoring and troubleshooting for many production workers.

Working conditions also depend on the type of food being processed. For example, some bakery employees work at night or on weekends and spend much of their shift near ovens that can be uncomfortably hot. In contrast, workers in dairies and meat processing plants work typical daylight hours and may experience cold and damp conditions. Some plants, such as those producing processed fruits and vegetables, operate on a seasonal basis, so workers are not guaranteed steady, year-around employment and occasionally travel from region to region seeking work. These plants are increasingly rare, however, as the industry continues to diversify, and processing plants produce alternate foods and beverages during otherwise inactive periods.

Employment

The food processing industry provided nearly 1.7 million jobs in 1998. Almost all employees are wage and salary workers,

but a few food processing workers are self-employed. In 1997, about 11,900 establishments processed food, over half employing fewer than 20 workers (chart). Nevertheless, establishments employing 100 or more workers accounted for nearly 80 percent of all jobs.

Food processing workers are found in all States, although some sectors of the industry are concentrated in certain parts of the country. For example, Arkansas, Georgia, Iowa, North Carolina, and Texas employ over a third of workers in meat producing industries. Wisconsin has more cheese processing workers than any other State. Similarly, most workers producing chewing gum work in Illinois and Pennsylvania. California accounts for more than 1 in 5 canned, frozen, and preserved fruit, vegetable, and food specialty workers, and together with Illinois, Pennsylvania, and New York, employs a third of all workers who produce bakery products. Employment in raw cane sugar processing is concentrated in Florida, Hawaii, and Louisiana.

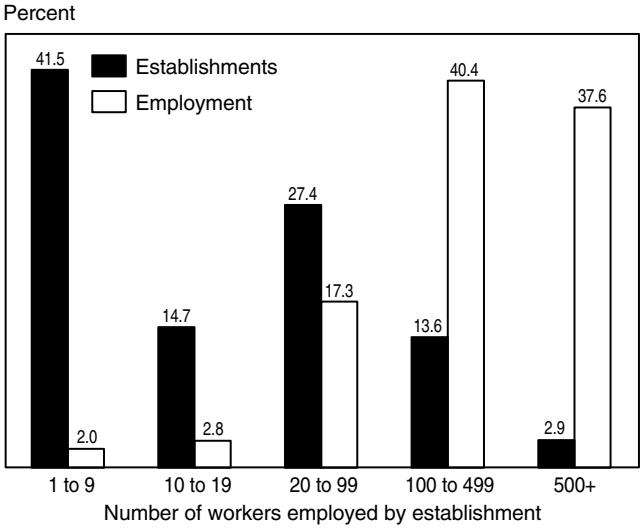
Occupations in the Industry

The food processing industry employs many different types of workers. About three-fourths are production workers, including skilled precision workers and less-skilled machine operators and laborers (table 2). Production jobs require manual dexterity, good hand-eye coordination, and in some industries, strength.

Red meat production is the most labor-intensive food processing operation. Because animals are not uniform in size, *slaughterers and meatpackers* must slaughter, skin, eviscerate, and cut each carcass into large pieces. They usually do this work by hand, using large, heavy power saws. They also clean and salt hides and make sausage. *Meatcutters* and *trimmers* use hand tools to break down the large primary cuts into smaller sizes for shipment to wholesalers and retailers. *Poultry trimmers and cutters* use knives and other hand tools to eviscerate, split, and bone chickens and turkeys.

Bakers mix and bake ingredients according to recipes to produce breads, cakes, pastries, and other goods. Bakers produce goods in large quantities, using mixing machines, ovens, and other equipment.

Nearly 80 percent of the jobs in food processing were in establishments that employed 100 or more workers



Source: U.S. Department of Commerce, *County Business Patterns*, 1997

Many food processing workers use their hands or small hand tools to do their jobs. *Cannery workers* perform a variety of routine tasks—such as sorting, grading, washing, trimming, peeling, or slicing—in canning, freezing, or packing food products. *Hand food decorators* apply artistic touches to prepared foods. *Candy molders* and *marzipan shapers* form fancy shapes by hand.

With increasing levels of automation in the food processing industry, a growing number of workers operate machines. For example, *food batchmakers* operate equipment that mixes, blends, or cooks ingredients used in manufacturing various foods, such as cheese, candy, honey, and tomato sauce. *Dairy processing equipment operators* process milk, cream, cheese, and other dairy products. *Cutting* and *slicing machine operators* slice bacon, bread, cheese, and other foods. *Mixing* and *blending machine operators* produce dough batters, fruit juices, or spices. *Crushing* and *grinding machine operators* turn raw grains into cereals, flour, and other milled grain products, and they produce oils from nuts or seeds. *Extruding* and *forming machine operators* produce molded food and candy, and *casing finishers* and *stuffers* make sausage links and similar products. *Bottle packers* and *bottle fillers* operate machines that fill bottles and jars with beverages, preserves, pickles, and other foodstuffs.

Cooking machine operators steam, deep fry, boil, or pressure cook meats, grains, sugar, cheese, or vegetables. *Grain roasters* operate equipment that roasts grains, nuts, or coffee beans, and *drying machine operators* tend ovens, kilns, dryers, and other equipment that removes moisture from macaroni, coffee beans, cocoa, and grain. *Baking equipment operators* tend ovens that bake bread, pastries, and other products. Some foods—ice cream, frozen specialties, and meat, for example—are placed in freezers or refrigerators by *cooling* and *freezing equipment operators*. Other workers tend machines and equipment that clean and wash food or food processing equipment. Some machine operators also clean and maintain machines and perform other duties such as checking the weight of foods.

Many other workers are needed to keep food processing plants and equipment in good working order. *Industrial machinery mechanics* repair and maintain production machines and equipment. *Maintenance repairers* perform routine machinery maintenance, such as changing and lubricating parts. Specialized mechanics include *air-conditioning* and *refrigeration technicians*, *farm equipment mechanics*, and *diesel engine specialists*.

Still other workers directly oversee the quality of the work and of final products. *Blue-collar worker supervisors* direct the activities of production workers. *Graders* and *sorters* of agricultural products, *production inspectors,* and *quality control technicians* evaluate foodstuffs before, during, or after processing.

Food may spoil if not properly packaged and promptly delivered, so packaging and transportation employees play a vital role in the industry. Among these are *freight, stock,* and *material movers*, who manually move materials; *hand packers* and *packagers*, who pack bottles and other items as they come off the production line; and *machine feeders* and *offbearers*, who remove goods from the end of the production line. *Industrial truck* and *tractor operators* drive gasoline or

electric-powered vehicles equipped with fork lifts, elevated platforms, or trailer hitches to move goods around a storage facility. *Truckdrivers* transport and deliver livestock, materials, or merchandise, and may load and unload trucks. *Driver/sales workers* drive company vehicles over established routes to deliver and sell goods, such as bakery items, beverages, and vending machine products.

The food processing industry also employs a variety of managerial and professional workers. Managers include *general managers* and *top executives*, who make policy decisions; *industrial production managers*, who organize, direct, and control the operation of the manufacturing plant; and *marketing, advertising,* and *public relations managers*, who direct advertising, sales promotion, and community relations programs.

Engineers, scientists, and technicians are becoming increasingly important as the food processing industry implements new automation. These workers include *industrial engineers,* who plan equipment layout and workflow in manufacturing plants, emphasizing efficiency and safety. Also, *mechanical engineers* plan, design, and oversee the installation of tools, equipment, and machines. *Chemists* perform tests to develop new products and maintain quality of existing products. *Computer programmers* and *systems analysts* develop computer systems and programs to support management and scientific research. Food scientists, such as *food technicians* and *technologists* and *chemical technicians*, work in research laboratories or on production lines to develop new products, test current ones, and control food quality.

Finally, many sales workers, including *manufacturers' representatives* and *demonstrators*, are needed to sell the manufactured goods to wholesale and retail establishments. *Bookkeeping* and *accounting clerks*, *procurement clerks*, and *traffic clerks* keep track of the food products going into and out of the plant. *Janitors* and *cleaners* keep buildings clean and orderly.

Training and Advancement

Most workers in production line food processing jobs require little formal education or training. Graduation from high school is preferred but not always required. In general, inexperienced workers start as helpers to experienced workers and learn skills on the job. Many of these entry-level jobs can be learned in a few days. Typical jobs include operating a bread slicing machine, washing fruits and vegetables before processing begins, hauling carcasses, or packing bottles as they come off the production line. Even though it may not take long to learn to operate a piece of equipment, employees may need several years of experience to enable them to keep the equipment running smoothly, efficiently, and safely.

Some food processing workers receive specialized training. Inspectors and quality control workers, for example, are often trained in food safety and may need a certificate to be employed in a food processing plant. In addition to specialized training, a growing number of workers receive broader training to perform a number of jobs. The need for flexibility in more automated workplaces has meant that many food processing workers are learning new tasks and being trained to effectively work in teams.

Advancement may come in the form of higher earnings or more responsibility. Helpers usually progress to jobs as machine operators, but the speed of this progression can vary considerably. Some workers who perform exceptionally well on the production line, or those with special training and experience, may advance to supervisory positions. Advancement opportunities may be influenced by plant size and the existence of formal promotion tracks.

Table 2. Employment in food processing by occupation, 1998 and projected change, 1998-2008

Occupation	1998 Employment Number	1998 Employment Percent	1998-2008 Percent change
All occupations	1,686	100.0	2.1
Operators, fabricators, and laborers	903	53.6	4.6
Meat, poultry, and fish cutters and trimmers, hand	140	8.3	24.6
Packaging and filling machine operators and tenders	138	8.2	6.0
Hand packers and packagers	113	6.7	3.5
Truckdrivers	88	5.2	-5.3
Cannery workers	48	2.9	-12.2
Freight, stock, and material movers, hand	41	2.5	-15.2
Crushing and mixing machine operators and tenders	32	1.9	4.1
Industrial truck and tractor operators	29	1.7	0.3
Cooking and roasting machine operators and tenders	28	1.6	-9.1
Dairy processing equipment operators	14	0.8	-18.8
Machine feeders and offbearers	13	0.8	7.7
Precision production, craft, and repair	360	21.4	3.2
Blue-collar worker supervisors	79	4.7	2.0
Butchers and meatcutters	59	3.5	3.2
Industrial machinery mechanics	52	3.1	8.4
Bakers, manufacturing	39	2.3	14.6
Inspectors, testers, and graders, precision	27	1.6	-10.8
Maintenance repairers, general utility	23	1.4	-6.6
Administrative support, including clerical	130	7.7	-8.0
Shipping, receiving, and traffic clerks	23	1.4	-7.9
Financial records processing occupations	22	1.3	-16.3
General office clerks	16	1.0	2.0
Executive, administrative, and managerial	100	5.9	-1.8
General managers and top executives	25	1.5	-1.3
Management support occupations	23	1.4	-1.1
Industrial production managers	16	1.0	-3.5
Marketing and sales	68	4.1	-2.3
Service	60	3.5	-9.5
Janitors and cleaners	33	2.0	-7.3
Agriculture, forestry, fishing, and related	28	1.6	5.1
Technicians and related support	20	1.2	-6.9
Professional specialty	17	1.0	11.7

Requirements for other jobs are similar to requirements in other industries. Employers usually hire high school graduates for secretarial and other clerical work. Graduates

of 2-year associate degree or other postsecondary programs often are sought for science technician and related positions. College graduates or highly experienced workers are preferred for middle management or professional jobs in personnel, accounting, marketing, or sales. Some specialized research positions may require a master's or doctoral degree in chemistry, engineering, food science or technology, or a closely related field.

Table 3. Average earnings of production or nonsupervisory workers in food processing by industry segment, 1998

Industry segment	Weekly	Hourly
Total, private industry	$442	$12.77
Total, food processing	482	11.80
Beverages	706	16.11
Grain mill products	680	14.89
Fats and oils	553	12.84
Dairy products	570	13.57
Sugar and confectionery products	539	13.05
Bakery products	520	12.75
Preserved fruits and vegetables	472	11.34
Miscellaneous foods	423	10.67
Meat products	398	9.66

Earnings

Table 3 shows that production workers in food processing averaged $11.80 an hour, compared to $12.77 per hour for all workers in private industry in 1998. Weekly earnings among food processing workers, however, were higher than average, $482 compared to $442, reflecting more hours of work. Food processing workers averaged about 41.7 hours a week, compared to only 34.6 for all workers in the private sector. Weekly earnings ranged from $398 in meat products manufacturing plants to $706 in beverages manufacturing plants. Hours worked play a large part in determining earnings. For example, fats and oils manufacturing workers, who averaged 43.1 hours a week, had lower hourly earnings but higher weekly earnings than bakery products manufacturing workers, who averaged 40.8 hours a week. Earnings in selected occupations in food processing appear in table 4.

In 1998, about 23 percent of workers in the food processing industry belonged to a union or were covered by a union contract, compared to 15.4 percent of all workers in the private sector. Prominent unions in the industry include the United Food and Commercial Workers, Teamsters, Bakery and Confectionery Workers, Grain Millers, and Distillery Workers.

Outlook

Employment in food processing is expected to grow by about 2 percent over the 1998-2008 period, more slowly than the 15 percent growth projected for all industries in the economy. The primary source of this growth will be the rising demand for food products by an increasing population. Growing automation and productivity will moderate the increase somewhat, but the rapid employee turnover in many segments of food processing will create numerous job openings for workers wishing to enter the industry.

Job growth will be concentrated among production workers—the largest group of workers in the industry. Because many of the sorting, cutting, and chopping tasks performed by these workers have proven difficult to automate, employment among hand workers will rise along with the growing demand for food products. One rapidly growing, hand-working occupation is meat, poultry, and fish cutters, whose employment will rise as the consumption of meat, poultry and fish climbs and more processing takes place at the manufacturing level. Indeed, many production workers will benefit from the recent rise in the share of processing that occurs in food processing plants instead of in retail establishments.

Table 4. Median hourly earnings of the largest occupations in food processing, 1997

Occupation	Food processing	All industries
First-line supervisors and supervisors/ managers-production and operating workers	$15.49	$16.62
Machinery maintenance mechanics	13.89	14.72
Truck drivers, heavy or tractor-trailer	12.81	13.08
Bakers, manufacturing	10.28	10.25
Packaging and filling machine operators and tenders	9.69	9.38
Janitors and cleaners, except maids and housekeeping cleaners	8.73	7.44
Slaughterers and butchers	8.69	8.67
Hand packers and packagers	8.30	6.90
Cannery workers	7.56	7.55
Meat, poultry, and fish cutters and trimmers, hand	7.46	7.51

Although automation has had little effect on most hand workers, it is having a broader impact on numerous other occupations in the industry. Fierce competition has led food processing plants to invest in technologically advanced machinery to be more productive. These machines have been applied to tasks as varied as packaging, inspection, and inventory control. As a result, employment has fallen among some machine operators, such as packaging machine operators, but has risen for industrial machinery mechanics who repair and maintain the new machinery. Computers are also being widely implemented throughout the industry, reducing employment levels of some mid-level managers and administrative support workers, but increasing the demand for workers with excellent technical skills. Taken as a whole, automation will continue to have a significant impact on workers in the industry as competition becomes even more intense in coming years.

Food processing firms will be able to use this new automation to better meet the changing demands of the American marketplace. As convenience becomes more important, consumers increasingly demand highly-processed foods such as pre-peeled and cut carrots and microwaveable soups or "ready-to-heat" dinners. Such a shift in consumption will contribute to the demand for food processing workers and will lead to the development of thousands of new

processed foods. Domestic producers will also attempt to market these goods abroad as international trade continues to grow. The combination of growing export markets and shifting domestic consumption will help employment among food processing workers to rise slightly over the next decade and will lead to significant changes throughout the food processing industry.

Sources of Additional Information

For information on job opportunities in food processing, contact individual manufacturers, locals of the unions listed above, and State employment service offices. Informational brochures on occupations in the industry are available from:

- United Food and Commercial Workers International Union, 1775 K St. NW., Washington, DC 20006.

Detailed information on many occupations in food processing, including the following, appears in the 2000-2001 *Occupational Outlook Handbook*.

- Butchers and meat, poultry, and fish cutters
- Blue-collar worker supervisors
- Handlers, equipment cleaners, helpers, and laborers
- Industrial production managers
- Material moving equipment operators
- Truckdrivers
- Science and mathematics technicians